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Writing Programs Efficiently Saves Time and Money

UTCS Advisors and Consultants see a lot of different approaches to writing programs, some of them not exactly ideal. There are many little things that can be done to speed up the process, and usually these will result in cost savings.

What follows is by no means a complete guide to writing efficient programs, but you might find these tips helpful. Most of the cases and examples refer to program development on the IBM system.

The biggest problem is people biting off more than they can chew. They write the whole program and try it. A better approach is to write the program in pieces. In general, write the input section first, then the processing section, then the output section. Use a lot of diagnostic printing while you are writing the program to see that the values produced are what you expect. It is also advisable to use only a fraction of the data, preferably a representative cross section of what will eventually be used with the program.

In a SAS program, work on the data step first. Again, make sure that the values read in are what you expected. Use a PROC PRINT or a PROC FREQ to see what values are read in. If your program isn't reading the proper data, further processing is wasted. So often, people read in 20000 lines of data when they could have found the problem in their program with 2 lines of data.

Another instance where much time can be saved is when tapes are involved. If you are writing a program that is to read data from a tape and produce some meaningful results, start small. Tape mounts are expensive and very slow compared with the turnaround time for a small Class A job. Take a portion of the data from the tape and put it on disk. While writing/debugging the program, have it read this small portion that is on disk.

Since you aren't mounting the tape each time you try a change in the program, the job will probably be able to run very quickly as Class A. A portion of the data can usually be brought down to disk quite easily. One method is to allocate a dataset that is much too small, copy the data into this dataset, and when the dataset is full the job abends and stops. You then have a fraction of the data available to work with. For SAS, you could use the OBS= and the FIRSTOBS= options to select a portion of a SAS dataset.

Recently, there have been a few cases where programs were brought from other machines to run here. Now often they will work fine, but sometimes there are differences. There is a mistaken impression among FORTRAN programmers that if a program is written in FORTRAN, then it will work everywhere. This is not necessarily true. In every vendor's version of FORTRAN there are "extensions." If you use these, you are making your program dependent on a feature that may not be available anywhere else. Extensions are always clearly marked in the vendor manuals. Fortunately, FORTRAN 77 makes programs more portable than any previous FORTRAN. For example, Character variables are used to store character strings, instead of N characters per Real or Integer variable. This means that no matter how many "bits" the processor you are using has, the character manipulations will work properly. Another good idea is to run a small version of the program to see if the cost is similar to that on previous machines. Try the program with some of the same data that was previously run on another machine and then make sure that the results are the same, or that any differences are reasonable. Once you are satisfied that the program works and that costs are in line with what you expected, then go for the production work.

It is also common to see a job fail just

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Programming Tips continued

when it was almost completed, because some limit (such as the number of printed lines or the amount of CPU time) was exceeded. As the programmer, it is important for you to understand what the limits are. You must be aware of both the default limits (limits in effect for various job classes) and those explicitly set by the programmer. The UTCS Guide to GPJS explains these limits. It is also important to estimate what resources you are going to consume. Running small jobs allows you to make educated predictions about the needs of the full-sized run.

When you are testing programs with new, complex JCL, using the /*SCAN statement can save lots of time. This statement should be the very last one of the entire job. It instructs the system to scan the JCL statements and see whether any JCL syn-

tax rules have been broken. In this way, you will discover very quickly any simple errors in your JCL, such as missing continuation lines or misplaced blanks. Note that since the job does not execute at all, it also does not allocate resources such as datasets. This allows a job that uses tapes, for example, to be scanned quickly but does not determine whether the datasets referred to are really there. The job will go almost immediately to print or to hold/fetch for examination.

There are other tools that can be used to help develop programs. Most of these are specific to a particular system or language and should be investigated before undertaking any large tasks. Please call Advising Services (978-HELP) for more information.

Terry Jones

Service Access Code (SAC) Expiry Dates

Users are reminded that Service Access Codes (SACs) have an option whereby an expiry date may be specified. This expiry date is the last day on which the SAC may be used to access services. After this date the SAC, along with all online data storage, is deleted. If a date is not specified, the SAC remains open and usable as long as the associated CAN is adequately funded.

Users are encouraged to verify that their SAC expiry dates are correctly specified, since an incorrect date may result in lost data as well as substantial dataset recovery charges. Expiry dates may be verified by calling Accounting Services at 978-8703.

Ron Vander Kraats

Microcomputer News

Donations

The Micro Lab has just received an "Apple Turnover" board, with software, from Vertex Systems of Los Angeles, California. Vertex makes the XenoDisk software, which translates between various disk formats. At the same time, we received the new release of XenoDisk.

Because of the differing disk electronics in the Apple and IBM microcomputers, nei-

ther can read the other's disks -- not even with clever software. The Apple Turnover solves this incompatibility by interposing special electronics, in the form of an expansion board, between the disk drives and the disk controller in an IBM PC. Once the electronics have been engaged by software, the IBM can then read, write, and format Apple disks. The Turnover board will thus allow us to transfer our library of public-domain Apple software easily onto the IBM PC-AT on which our Microcomputer Bulletin Board System (BBS) runs.

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Microcomputer News continued

We heartily recommend the Apple Turn-over system to any individual or department that must cope with frequent movement of data between Apple and IBM machines.

Periodicals

Two periodicals, one of them quite new, may be of interest to users of microcomputers in the University.

The first is *Research in Word Processing Newsletter*, from the South Dakota School of Mines and Technology, Rapid City, SD 57701. We have referred to it before as the source of our initial information about Notebook II (mentioned below), but we repeat the notice because we have decided to subscribe and to obtain as many of the back issues as are now in print. This Newsletter will be made available for consultation on request.

The second is *Scholarly Communication*, published by the Office of Scholarly Communication and Technology, an affiliate of the American Council of Learned Societies; the mailing address of the Office is 1717 Massachusetts Avenue N.W., Washington, D.C. 20036. As far as we know only the pilot issue for this projected new publication is in print (No. 1, June 1985, 12 pp.). Although it is not exclusively concerned with the use of microcomputers, it addresses the larger scholarly environment of which they are an increasingly important part and, at least in this first issue, contains several items on the application of microcomputers. Several packages receive brief mention, some with reference to reviews published elsewhere. The lengthiest item is an excerpt from a letter by Professor Peter Lyman of Michigan State University, "Introducing Computers to Humanists" (pp. 6-8), on the Tiro Project at Stanford University, whereby 144 faculty members in 17 departments were given IBM PCs for use in their work. Professor Lyman's research was "focused upon how computers

might change the quality and content of scholarly writing in the humanities" (p. 6).

Paradigms for Word Processing

As Professor Lyman points out, "new technologies tend to be defined as efficient new tools for traditional tasks," and thus most novices tend to think of the microcomputer as a kind of typewriter or printing press (p. 7). As at Stanford, these conceptual models are generally useful in easing the transition from old to new methods, but they soon prove constricting.

In the case of word processing, the typewriter is a very poor model for the multilingual academic. On a typewriter, the relationship between keys and characters is of one key to one character, with no significant intervening steps, whereas the microcomputer has the potential for a relationship in which one key can have many meanings, with whatever intervening steps the speed of the processor may allow. Word-wrap, automatic reformatting, and hyphenation are primitive examples of the kind of processing that *could* be extended to functions we now associate with the proofreading stage. Most of this is probably beyond the power of current machines, but since the technology of microcomputers is evolving so quickly, it will not be long before the capability is within reach of software. Thus it is important to begin discussion now on what we might want those more evolved machines to do.

One package that already embodies a major step towards realizing the full potential of the microcomputer as a writer's tool is T3 ("T-cubed"), originally intended for technical writers but suitable for anyone who has demand for an extensive, unusual, or changing character set. (At present, languages normally written from right to left are effectively excluded.) In T3 the *physical* keyboard is distinct from an indefinitely large number of *logical* keyboards that can be attached to the physical device; in addition, any one of an indefinitely large number of fonts can be assigned to any of

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Microcomputer News continued

these logical keyboards. Preexisting fonts can be supplemented by characters of the user's design, which are stored and retrieved in the same way as the standard characters. There are, of course, potential drawbacks: the package is missing some common features (soon to be supplied, we are told -- and tend to believe), and it only runs well in a fully configured PC-XT with a Hercules Graphics Card (or the equivalent). A review of T3 is contained in the forthcoming *Academic's Guide to Microcomputer Systems* and on the BBS.

Textual Database Managers

Another extension to the paradigm of the microcomputer as a typewriter is in effect when you use the machine as a filing system, for which word processing software is largely inappropriate. Properly speaking, this is the domain of another kind of software, the database manager. Here the initial analogy is with the ubiquitous box of 3" x 5" cards. In the last issue of *COMPUTERNEWS*, I remarked that what academics generally require of database management in their own research is not yet clear; nevertheless, some guidelines can be mentioned, at least for *textual* work on the IBM-style PC:

1. The equivalent of the individual card must be similarly free-form, with a potentially large number of demarcated areas (or "fields") per card.
2. Each field must be of variable length, since notes (unlike numeric data) can seldom be made to conform easily to a fixed space.
3. Entry of extended ASCII (e.g., accented) characters must be simple and convenient and some reasonable facility provided for sorting and printing words containing them (they must, of course, be visible on screen as themselves).
4. It must be possible to search the contents of every field for the occurrence of a given string of characters (perhaps also for its absence or in combination with the conditional pres-

ence of another character string) and to extract the relevant records either for printing or for subsequent searches.

5. It must be possible to "index" individual fields in the manner of dBASE II, that is, to access fields as if they had been entered in alphabetical order, without having to rearrange (sort) them on disk.
6. It must be possible to connect two or more files together so that, for example, in each of many notes taken on a given book, the bibliographic information does not have to be repeated.
7. It must be possible to produce a convenient index (i.e., a true *index* of the conventional kind) or a summary of the contents of a set of electronic cards. One way to do this would be to allow the assignment of an index heading, with subheadings, to each card and provide a function in software for collating the headings and producing an alphabetized list with numbers that refer to the cards. Another way would be to produce by software an alphabetized word list based on the contents of a specified field, with numbers referring back to the cards.
8. Finally, the database manager should provide reasonable if limited word processing facilities, so that, for example, the user can move about quickly within a field, add and delete text rapidly and conveniently, and so forth.

(Please note that the above guidelines are merely those arrived at through the experience of one person in the course of his work; they are meant to provoke discussion, not to end it. We will be happy to discuss the application of database management to research with any interested user.)

One commercial package that implements several of these guidelines is Notebook II; it does 1, 2, 4, 5, and 8 well, 3 and 7 partially, and 6 not at all. For some academic applications it could be nearly perfect, though in general it does not go far

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Microcomputer News continued

enough. A review of this package is also contained in the forthcoming *Guide* and on the BBS.

Notebook II is a package already tailored to a particular kind of use, broad as that kind may be. Database managers such as dBASE (or FoxBASE, a decided improvement on dBASE II) are far more general; they include a command or programming language out of which application software can be built and are thus inherently more flexible than tailored packages. With these, however, programming is frequently necessary to achieve the same results (or better), and although programming can be enjoyable, it

takes your time if you do it and your money if someone else does. The more general packages also have their limitations, some of them due to the fact that they were not written with the requirements of a textual database in mind. Thus dBASE II and III, for example, have implemented guidelines 1, 4, 5, 6, and 7, but not 2 at all, and 3 and 8 poorly. For reviews of some products and further comment, please see the *Guide*, or call us at 978-8701.

Dr. Willard McCarty

Microcomputer Bulletin Board System (BBS)

The UTCS Microcomputer Bulletin Board System (BBS) has been in production since June 24. It is available 24 hours a day except 9:00 a.m. to noon on weekdays. For the first two weeks of operation, it averaged over 20 calls a day (not counting requests by new users to authorize their accounts), with most calls placed in either the 12:00-4:00 p.m. or 7:00-11:00 p.m. time periods.

We are installing more and more public-domain software on the BBS. Most of what is there now is MS-DOS software. The CP/M Users Group is presently weeding out the better CP/M software and uploading it to the BBS. Since we now have an Apple Turnover Board (see preceding article), we are in a position to begin adding Apple public-domain software as well.

Users are also uploading some software. After software is uploaded, the BBS System Operator (Sysop) makes sure it is truly public domain and then moves it into a public area; this is usually done the next day. Each file should be accompanied by a short description, sent to the Sysop as a message, to make the file area directories more meaningful.

Some new users have apparently been put off by the authorization process we've insti-

tuted for people who are not already on the BBS users list. Please bear with us -- the one-day verification period is a small price to pay for what is being provided as a free service: we're trying to protect ourselves, and our users, from malicious access and tampering by non-University people.

You'll notice references to the *Academic's Guide to Microcomputer Systems* in bulletins posted on the BBS. We are adding, in plain ASCII form, copies of all the hardware and software reviews that appeared in earlier drafts of the *Guide*, as well as new reviews not yet included. The editing necessary to make the text "vanilla" does slow us down a bit, but it should allow the reviews to be printed on *any* printer in a readable fashion.

Recent reviews already on the BBS include dBASE III, ViewFinder, Notebook II, and T3 ("T-cubed"). They're in the "General" file area and may be downloaded and then printed on your local printer. Use the F)iles command to get a list of files in the General area; files with an extension of .RQV (the squeezed version of .REV) are reviews or extracts from the *Guide*. We expect to add reviews of DATAEASE, Bibliography, Nota Bene, and Microsoft FORTRAN in the next few weeks.

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Bulletin Board System continued

Finally, we would like to encourage micro users to sign on to the BBS -- the more users, the more information can be shared. With over 300 names on the BBS users list now, the potential amount of collective information is enormous, but not all of these people have signed on yet. There is a complete messaging system available, so it should be easy for you to get answers to

out-of-the-way questions, if more and more micro users participate. Written instructions for accessing the BBS are available from the UTCS Information Office, or call the Micro Advising line at 978-8701 for further information.

Paul Roth

Software on the Bulletin Board System

The Bulletin Board System (BBS) contains a growing library of public-domain software that you can download to your machine. Among the items in the IBM PC library are three programs of considerable interest to those who have lots of text or other data stored on PC floppy disks: SQUEEZE, UNSQUEEZE and LIBR.

SQUEEZE does what its name implies: it compacts a file into a much smaller size in such a way that it can later be exactly reconstituted by its opposite, UNSQUEEZE. LIBR ("library") can be used to gather a group of squeezed (or "unsqueezed") files into one master file such that they can later be extracted; in that way a number of related files can be kept together securely without the chance of losing one of them in a shuffle. Together these three programs are a great tool for archival storage of files on floppy disks.

Although they are not supported by UTCS or anyone else, SQUEEZE, UNSQUEEZE, and LIBR work -- in UTCS' experience, faultlessly. In fact, the Microcomputer Support Group (MSG) uses them for compacting the public-domain programs on the BBS. Once you have an account on the BBS (see preceding article), you may obtain these programs by first downloading LIBR.EXE, UNSQUEEZE.COM, and SQZUNSQZ.LBR, and then using LIBR to unpack SQZUNSQZ.LBR, which contains

SQUEEZE.COM. For all three programs, typing the name of the program alone will give you a short explanation of the command syntax. Unfortunately the explanations are terse. Call the MSG at 978-8701 if you need help.

DSKWATCH is an example of a useful PC-DOS program. Whenever an error occurs during a disk operation, DOS performs a retry automatically. After a few unsuccessful attempts, it will tell you about the error, but if the retry succeeds, there will be no error message. DSKWATCH is a small program that monitors disk errors for you. When I first tried this program, I discovered that my own floppy controller board had a bad chip that was causing intermittent errors. With the chip replaced, it runs clean. If you have a floppy that is getting worn or damaged, you will know about it sooner with this program and will likely be able to make a copy before data is lost.

KBSTAK is a little program that performs a function similar to what Batch files do. The main advantage of KBSTAK is that it will also feed commands to a program instead of just to DOS. Batch file execution stops when a program fires up; KBSTAK keeps feeding data to the program.

For those of you who play games, there is LEM2, a lunar lander game in BASIC. For those who forget to turn off the computer and end up with an image burned onto the

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Bulletin Board System continued

face of the monitor, there is SCRNSAVE. This is a program that monitors screen activity; after a certain period of inactivity it clears the screen.

These are just a few of the programs available on the Bulletin Board System. Download some and try them!

Terry Jones

New IBM Computers Installed

Over the last few months, new IBM computers have been installed at UTCS to replace older machines. IBM completed the installation of a 4381 Model 2 computer with 16 Megabytes of memory and a short string of 3380 disk storage units on April 24. Our VM/CMS service was moved to this machine on May 8 from the 3033/U16 computer, which was subsequently withdrawn from service.

A 4381 Model 3 computer with 32 Megabytes of memory was installed to replace the 3033/N12 system on June 8 and now delivers MVS-based academic services. The 3033/N12 machine has been retired from service at U of T.

On July 27, the 4341 computer used for administrative computing was replaced by another 4381 Model 3 machine.

The 4381 computers are fairly new IBM products; the Model 3 is the current top of the 4300 line of computers and is a dyadic processor with roughly the power of the old 3033/N12 computer. It occupies approximately the same amount of floor space as a typical office desk.

Very few problems were encountered during these installations, a fact which can be attributed to the work of IBM Field Service staff and several UTCS staff.

Bob Chambers

VM/CMS Interim Service Rates

Beginning June 10, Service Access (Userid) Codes (SACs) for CMS became available through the UTCS Accounting Office. Spending controls are not yet in place, but users may view their session-related charges through the "cost" command.

University rates are as follows:

CPU	\$6.00/CPU Minute
IOUSE	\$0.30/1000 IOUSE
CONNECT	\$1.00/Hour
VM ACCOUNT CHARGE	\$1.75/Mb/Month
VM USAGE CHARGE	\$0.25/Mb/Hour
ONLINE STORAGE	\$0.26/Cyl/Day
NETNORTH	\$1.00/1000 Records

A complete description of what the charge components are and how charges are calculated is available from the Accounting Office, Room 337, McLennan Physical Labs.

Marg Doherty

Custom Tailoring Your CMS PROFILE EXEC

When a CMS account is set up, a file called PROFILE EXEC is created and stored in the account for you. The PROFILE EXEC file contains a sequence of commands that are executed every time you start CMS. You can customize your CMS account by modifying your PROFILE EXEC. However, note that:

1. The first line of your PROFILE EXEC must be of the form
/* ... anything in here ... */
2. You must not delete the UTCSPROF statement, which is already there.

What kind of commands should you add to your PROFILE EXEC? Any commands that you would like to be executed every time you get into CMS. For example, you might like to define your PF (program function) keys. If you wanted to get help simply by hitting the PF1 key, you would add

"CP SET PF1 IMMED HELP"

to your PROFILE EXEC.

If you are using CMS mainly to run a specific language or product that requires a

GETME command, you can add this to your PROFILE EXEC. For example, SAS users could put "GETME SAS" in their PROFILE EXEC. Likewise, FORTRAN users who call IMSL subroutines could place both "GETME FORTRAN" and "GETME IMSL" into their PROFILE EXEC, followed by a GLOBAL statement which names the TXTLIBs needed.

If you want your output to be sent to a specific printer destination and/or use a special forms code, put this in your PROFILE EXEC. For example, to have your output printed at the Engineering Annex printer, place the statement

"ROUTE PRINT DEST EAT"

in your PROFILE EXEC. To have output printed on the laser printer with the YXLE forms code, use

"ROUTE PRINT DEST CENTRAL FORM YXLE"

For more information about customizing your PROFILE EXEC to suit your needs, see the UTCS Guide to VM/CMS.

Roni Moravan

CMS KERMIT

To allow the transfer of files between a user's microcomputer and CMS, UTCS has installed a version of KERMIT on the CMS machine.

KERMIT is a program that provides error-free file transfers. It works by having two KERMIT programs running, one on your microcomputer and one on the host (in this case CMS). These two programs cooperate in transferring files.

The CMS KERMIT has the usual KERMIT commands, such as SEND and RECEIVE,

but it also has some commands specific to CMS, for example, SET LRECL and SET RECFM. For details see the "Help" file described at the end of this article.

If your microcomputer is an IBM PC or XT, you should use the most recent version of the MS-DOS KERMIT for the IBM PC (Version 2.27d), as it has features that are useful for CMS. In particular, this new IBM PC KERMIT emulates a VT52 terminal so that you can access CMS via the Series/1, using your PC as a terminal. For more information, see the UTCS Guide to

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CMS KERMIT continued

IBM PC KERMIT. For additional information on using this KERMIT with CMS, see the important note at the top of the initialization file (MSKERMIT.INI) for the IBM PC KERMIT.

In order to access CMS KERMIT, use the GETME command and type "GETME

KERMIT". For more information on CMS KERMIT, type "Help KERMIT" after accessing KERMIT through GETME. Detailed documentation is found in the file "KERMIT DOC", on the KERMIT mini-disk.

Philip Murton

Pseudotypesetting on GP UNIX and CMS

Pseudotypesetting on GP UNIX was announced in the June issue of *COMPUTER-NEWS*. With the commencement of the interim CMS service, pseudotypesetting is now available with SCRIBE on CMS.

Examples of pseudotypeset output are posted on the wall outside of the Machine Room in McLennan Labs. Instructions for using SCRIBE to produce pseudotypesetting are found in the UTCS Guide to SCRIBE and in a document that may be printed from CMS and GP UNIX:

On CMS, type

```
copyfile 87set mss * 87sample mss a
```

then,

```
scribe 87sample (x8700
```

You then print the document by typing

```
87set 87sample
```

The document will print in the "PressRoman" font. You can try out the "Univers" font by inserting the command "@style(FontFamily Univers10)" near the beginning of the file "87sample mss" and repeating the process.

For more help, you can see HELP SCRIBE and HELP 87SET on CMS.

On GP UNIX, type

```
cp /usr/scribe/news/87set.mss 87sample.mss
```

then,

```
scribe -8 87sample.mss
```

You then print the document by typing

```
s8700 87sample.x8700
```

As in CMS, you can change the font family by inserting the @style(FontFamily Univers10) command near the beginning of the file.

For more information, see the GP UNIX online manual pages for *scribe*, *s8700* and *ipr*.

You should also consult the revised UTCS Guide to SCRIBE, now available on GP UNIX and at the Information Office.

Patricia Hood

8700 Character Set Changes

In the past few months a number of changes have been made to the character sets on the 8700 laser printer. Characters have been added or revised to improve their legibility. Users of the 8700 Document Printing Service now have greater flexibility in their font selection for bold

characters. Bold is now available for character sets N, O and P. Users interested in more information about the font changes should contact Advising Services at 978-HELP.

Patricia Hood

VS FORTRAN Release 4.0 Now Available

IBM VS FORTRAN Release 4.0 is now available at UTCS for user testing.

New Features

1. Automatic precision increase — allows users to boost the precision of floating point items in an existing program without recoding it.

Single -> Double
Double -> Extended

2. Users can now simply recompile their programs with the AUTODBL option.
3. MAP and XREF output can be formatted to be 72 columns wide instead of 120. This will allow easy viewing at your terminal.
4. LIST output now gives ISNs, and XREF output identifies uninitialized variables.
5. An explicit SDUMP (symbolic dump) option is now available. SDUMP tables have been condensed and simplified.
6. Execution-time error messages have been expanded to supply line numbers, ISNs, and offsets. This allows you to find the exact location of execution errors.
7. The compiler can create a reentrant version of the object-code portion of a program.

Character assignment and comparisons are now handled by in-line code, rather than calls to a library, resulting in faster execution time.

In Release 4.0, all library modules (excluding mathematical routines) can be either link-edited into the load module with your compiled program, or loaded dynamically at execution time. Execution-time loading is the default at UTCS. Its advantages include smaller load modules and faster execution in the compile-link-go mode.

Accessing VS FORTRAN Release 4.0

On MVS, use the following procedures:

FORN	Compile only
FORNLE	Compile and Linkedit
FORNLEGO	Compile, Linkedit, and Execute
FORNGO	Compile, Load, and Execute
FORNGOUL	Compile, Linkedit, and Execute (includes Gould plotter)
FORNPLLOT	Compile, Linkedit, and Execute (includes Calcomp plotter)

On VM/CMS, use:

```
GETME FORTRAN NEW
GLOBAL TXTLIB VLNKMLIB VFORTLIB CMSLIB
```

The following IBM manuals on VS FORTRAN Release 4.0 are available for reference in the UTCS Information Office (Room 206, Engineering Annex).

VS FORTRAN Programming Guide Release 4.0 (SC26-4118-0) provides guidance on designing, coding, compiling, and debugging VS FORTRAN programs.

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VS FORTRAN continued

VS FORTRAN Language and Library Reference Release 4.0 (SC26-4119-0) outlines the programming rules for VS FORTRAN. It also indicates the rules for using the execution- or run-time library routines and

defines the algorithms used to implement them.

If you have questions or problems, please call Advising Services at 978-HELP.

Roni Moravan

UTCS Noncredit Short Courses

UTCS offers a number of short, noncredit courses on the use of various products and services that we support. These courses are available to students, faculty and staff of the University of Toronto, as well as to other users of our system.

Complete course descriptions for all noncredit courses offered at UTCS are available at the Information Office, Engineering Annex, Room 206, and at the Accounting Services Office, McLennan Labs, Room 337.

All short courses are held in the UTCS Education Facility, Room 221, McLennan Physical Laboratories. Due to the limited seating capacity in the Education Facility, and the number of terminals available for our hands-on courses, registration is required for short courses.

Please note that we reserve the right to cancel courses, if registration is too low.

Anyone interested in taking any of these courses must register in person with:

Education Coordinator
Engineering Annex, Room 207
978-4565

A nonrefundable Administration Fee of \$10 per course is due at the time of registration.

It may be paid by cash, cheque or on a Customer Account Number (CAN).

(Anyone interested in credit courses should contact the Dept. of Computer Science at 978-6360).

The following courses are offered in August:

TXT/SCR102 - SCRIBE FORMATTER

DATE: August 6-7, 1985

TIME: 9:30-12:30 noon

TXT/SCR202 - SPECIAL SCRIBE TOPICS

DATE: August 8-9, 1985

TIME: 9:30-12:30 noon

SAS/CMS101 - INTRODUCTION TO SAS AND CMS

DATE: August 12-23, 1985

TIME: 2:00-4:00 p.m.

FORT/CMS101 - INTRODUCTION TO FORTRAN FOR CMS USERS

DATE: August 19-23, 1985

TIME: 9:30-12:30 p.m.

This course is designed for experienced FORTRAN programmers who want to use VS FORTRAN under CMS. Course material includes editing programs and data on CMS, compiling, linking, program execution and using the FORTRAN Interactive Debug package to debug programs.

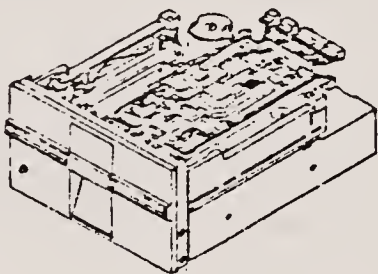
Irene Rosiecki

PC Maintenance

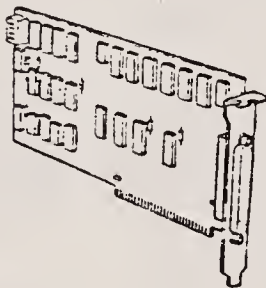
The UTCS Communications and Technical Support Group offers both on-site and drop-off (depot) maintenance for the IBM PC and the IBM PC-XT. The rates are as follows:



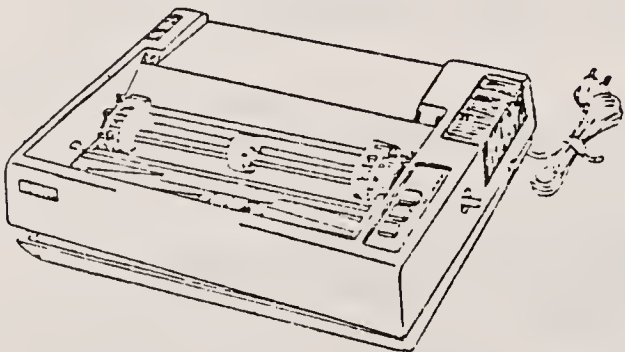
ITEM	MONTHLY RATE	
IBM PC	on site	depot
System unit (system board — 5 adaptor slots, 8088 microprocessor, 40KB ROM, power supply), up to 256KB RAM	\$10	\$ 7



IBM PC-XT		
System unit, up to 256KB RAM, 10MB fixed disk, 1-360KB floppy drive	\$39	\$29
Expansion unit (8 slots, power supply, receiver, interface and expansion boards, cable)	\$ 8	\$ 6



OTHER ITEMS		
360KB floppy drive	\$ 4	\$ 3
10MB fixed disk drive	\$25	\$19
IBM monochrome display	\$ 3	\$ 2
IBM colour display	\$ 7	\$ 6
IBM memory expansion board	\$ 3	\$ 2



Prices quoted for I/O devices include IBM adaptor boards. Non-IBM adaptor boards may be subject to an additional charge.

For quotations on other I/O devices or for more information on the above prices, contact Kam Mark at 978-5050.

Change Committee

Changes to the 3033/N12 MVS Machine and 4341 Administrative Machine

1. Card punch service was discontinued on May 1.
2. Class W service was removed from operation May 30 and was followed by the removal of HSJS PROC on May 31.
3. As of May 22, datasets associated with expired SACs are automatically deleted after a 10 day grace period.
4. IMSL 9.2 became available for user test on June 1. The test libraries are APPL.MATH.IMSL92DP and APPL.MATH.IMSL92SP.
5. The 3033/N12 was replaced with a 4381-R03 on June 8.
6. Data Facility Product (DFP) was installed on the MVS machine on June 17. This product replaces DF/EF and SAM-E and provides 3480 emulation support.
7. Interactive Debug and TESTFORT were removed from the MVS machine on June 17 due to lack of use.
8. Release 6 of DFSORT was made available on June 17.

Changes to GP UNIX

1. Six NTS ports were moved from the

DECsystem-10 to GP UNIX on May 1 to improve access.

2. A typesetting service became available using SCRIBE on GP UNIX as of June 5.
3. KERMIT was given Class C status on GP UNIX on June 18.

Changes to other Systems and Services

1. Corrections of certain font defects on the 8700 were completed on May 7. Corrections include, in part, improvement of the 2-up font for standard forms and the addition of certain accents on 1-up fonts.
2. CMS service was moved from the 3033/U16 to the 4381-R03 on May 28.
3. Seven additional EAT terminals were connected to CMS via the Series/1 on June 3 to improve access.
4. Optical fibre was installed for communication purposes between CSRI, CTS and CDF.
5. Micro Bulletin Board was introduced for the use of microcomputer users on campus.
6. Upper- and lower-case characters were added to the 8700 ALA font.

Beverly Scarborough

Documents at UTCS

All vendor-produced documentation may be ordered through the UTCS Information Office, Room 206, Engineering Annex. UTCS documents and selected vendor documents are also stocked there for purchase. Whenever feasible, documents are made available online, and users are encouraged to print their own copies. On the MVS and VM machines, special commands have been provided for this purpose.

To print online documents on

IBM MVS

WYLBUR users type "do document"

TSO users type "help document"

APL users type "LOAD 1 UTCSGUIDE<CR>HELP"

IBM VM/CMS

type "help document"

GP UNIX

use ipr or cat command

Recommended forms code for the 8700 is YXLE unless otherwise noted.

UTCS Documents in hardcopy

New:

UTCS Guide to VM/CMS

continued...

Documents at UTCS continued

Previously announced:

UTCS GUIDE TO PRODUCTS AND SERVICES:

Introduction

UTCS GUIDE TO PRODUCTS AND SERVICES:

Basics

UTCS GUIDE TO PRODUCTS AND SERVICES:

Accounting

UTCS Catalogue: Access, Part 1

UTCS Catalogue: Access, Part 2

UTCS Catalogue: IBM MVS Utilities

UTCS Catalogue: Numerical Products

UTCS Catalogue: Statistics Products

UTCS Catalogue: Storage

UTCS Catalogue: Text Products

UTCS Guide to Census Tapes

UTCS Guide to File Transfer Service

UTCS Guide to Highspeed Printing

UTCS Guide to KERMIT

UTCS Guide to Mainframe File Transfer Facility

UTCS Guide to Text Processing on GP UNIX

UTCS Documents online

New:

UTCS Guide to VM/CMS

MVS: MANUAL=MSGD

CMS: LISTING=MSGD

Previously announced:

UTCS GUIDE TO PRODUCTS AND SERVICES:

Basics

MVS: MANUAL=BASICS

CMS: LISTING=BASICS

GP UNIX: /usr/doc/utcs/basics

UTCS Catalogue: IBM MVS Utilities

MVS: MANUAL=MVSUTIL

CMS: LISTING=MVSUTIL

Product-Function List

MVS: MANUAL=UTILLIST

CMS: LISTING=UTILLIST

Recommended forms code is BXQD.

UTCS Catalogue: Numerical Products

MVS: MANUAL=NUMCAT

CMS: LISTING=NUMCAT

GP UNIX: /usr/doc/utcs/numcat

Product-Function List

MVS: MANUAL=NUMLIST

CMS: LISTING=NUMLIST

GP UNIX: /usr/doc/utcs/numlist

Recommended forms code is BXQD.

UTCS Catalogue: Statistics Products

MVS: MANUAL=STATCAT

CMS: LISTING=STATCAT

Product-Function List

MVS: MANUAL=STATLIST

CMS: LISTING=STATLIST

Recommended forms code is BXQD.

UTCS Catalogue: Text Products

MVS: MANUAL=TEXTCAT

CMS: LISTING=TEXTCAT

GP UNIX: /usr/doc/utcs/textcat

UTCS Guide to APL

MVS: MANUAL=APLGD

UTCS Guide to APL XFR

MVS: MANUAL=APLXFR

UTCS Guide to BMDP

MVS: MANUAL=BMDP

CMS: LISTING=BMDP

UTCS Guide to Census Tapes

MVS: MANUAL=CENSUS

CMS: LISTING=CENSUS

GP UNIX: /usr/doc/utcs/census

UTCS Guide to File Transfer Service

MVS: MANUAL=FTS

UTCS Guide to GP UNIX

GP UNIX: /usr/doc/utcs/gpunix

UTCS Guide to GPJS

MVS: MANUAL=GPJSX

CMS: LISTING=GPJSX

GP UNIX: /usr/doc/utcs/gpjs

UTCS Guide to Highspeed Printing

MVS: MANUAL=PRINT

CMS: LISTING=PRINT

GP UNIX: /usr/doc/utcs/print

UTCS Guide to IBM MVS Online Storage

IBM: MANUAL=IBMDISK

UTCS Guide to KERMIT

MVS: MANUAL=KERMIT

CMS: LISTING=KERMIT

GP UNIX: /usr/doc/utcs/kermit

UTCS Guide to Mainframe File Transfer Facility

MVS: MANUAL=MFTF

UTCS Guide to SAS

MVS: MANUAL=SAS

CMS: LISTING=SAS

UTCS Guide to SCRIBE

GP UNIX: /usr/doc/utcs/scribeguide

(For printing instructions, see page 1 of document.)

UTCS Guide to Series/1 Terminal Use

MVS: MANUAL=SERIES

CMS: LISTING=SERIES

3270 Emulation:

UTCS Guide to

Cybernex APL100 and Volker Craig VC404

(MANUAL=CYBER)

(LISTING=CYBER)

DM1520 (MANUAL=DM1520)

(LISTING=DM1520)

Hardcopy Terminal

(MANUAL=HARDCOPY)

(LISTING=HARDCOPY)

IBM 3101 (MANUAL=IBM3101)

(LISTING=IBM3101)

SOROC IQ (MANUAL=SOROC)

(LISTING=SOROC)

VT52 (MANUAL=VT52)

(LISTING=VT52)

VT100 (MANUAL=VT100)

(LISTING=VT100)

UTCS Guide to SPSS

MVS: MANUAL=SPSS

CMS: LISTING=SPSS

continued...

Documents at UTCS continued

UTCS Guide to SUBUTILS
MVS: MANUAL=SUBUTILS
CMS: LISTING=SUBUTILS
UTCS Guide to Text Processing on GP UNIX
GP UNIX: /usr/doc/utcs/text
UTCS Guide to TFW.MAK in SCRIBE
CMS: LISTING=TFWMAK
GP UNIX: /usr/doc/utcs/tfwguide
UTCS Guide to TSO (Draft)
MVS: MANUAL=TSOGD
UTCS Guide to UTDSUTIL
MVS: MANUAL=UTDSUTIL
CMS: LISTING=UTDSUTIL
UTCS Guide to WYLBUR
MVS: MANUAL=WYLINTRO
UTCS WYLBUR Tutorial
MVS: MANUAL=WYLTUTOR

Other Documentation online:

Waterloo SCRIPT
Reference Manual
MVS: MANUAL=WSCRPTRF
CMS: LISTING=WSCRPTRF
Recommended forms code YXLC
User's Guide
MVS: MANUAL=WSCRPTUG
CMS: LISTING=WSCRPTUG
Recommended forms code YXLC
GML User's Guide
MVS: MANUAL=GMLUG
CMS: LISTING=GMLUG
Recommended forms code YXLC

Hours of Service

Labour Day			
	August 31 (Saturday)	September 1 (Sunday)	September 2 (Monday)
IBM MVS GPJS (Classes B and E, Calcomp)	10:00-18:00	10:00-18:00	closed
IBM MVS GPJS (Class A, WYLBUR, APL, TSO)	10:00-18:00*	10:00-18:00*	unattended
IBM VM/CMS	10:00-18:00*	10:00-18:00*	unattended
GP UNIX	10:00-18:00*	unattended	unattended
Normal hours of service will resume on Tuesday, September 3, 1985.			
* Running unattended outside these hours.			
For NORMAL HOURS OF SERVICE see UTCS Terminal & Advising Sites at the back of this issue of COMPUTERNEWS.			
In the event of any changes to this schedule, a notice will appear in HOTNEWS one week prior to the holiday.			
Summer hours of service for the University of Toronto will be in effect through August 30, 1985. UTCS' office hours will be 08:45 to 16:30 during this time.			

Recent Acquisitions in the Computer Library

ACM Symposium on Principles of Programming Languages, 12th, New Orleans, 1985.
Conference record.
New York, ACM, 1985.

ACM Symposium on Theory of Computing, 17th, Providence, R.I., May 1985.
Proceedings.
New York, ACM, 1985.

Association for Computing Machinery.
ACM guide to computing literature, 1983.
New York, ACM, 1985.

Beni, Gerardo and Hackwood, S. eds.
Recent advances in robotics, v.1.
New York, Wiley, 1985.

Bever, Thomas G. et al.
Talking minds: the study of language in cognitive science.
Cambridge, Mass., MIT Press, 1984.

Charniak, Eugene and McDermott, D.V.
Introduction to artificial intelligence.
Reading, Mass., Addison-Wesley, 1985.

Gotlieb, C.C.
The economics of computers: costs, benefits, policies, and strategies.
Englewood Cliffs, N.J. Prentice-Hall, 1985.

Johnson, Deborah G. and Snapper, J.W., eds.
Ethical issues in the use of computers.
Belmont, Cal., Wadsworth, 1985.

Lampson, B.W. et al, eds.
Distributed systems - architecture and implementation: an advanced course.
New York, Springer-Verlag, 1981.

Nanney, T. Ray.
Computing and problem-solving with Pascal.
Englewood Cliffs, N.J., Prentice-Hall, 1985.

Rylko, Henry M., ed.
Artificial intelligence, v.1: bibliographic summaries of the select literature.
Lawrence, Kansas, the Report Store, 1984.

Sullivan, David R. et al
Computing today: microcomputer concepts and applications.
Boston, Houghton Mifflin, 1985.

Symposium on Mathematical Foundations of Computer Science,
11th, Praha, Czechoslovakia, Sept. 1984.
Mathematical foundations of computer science 1984.
Berlin, Springer-Verlag, 1984.

Tutte, W.T.
Graph theory.
Reading, Mass., Addison-Wesley, 1984.

Zissos, F.
System design with micro processors. 2d ed.
London, Academic Press, 1984.

Stephanie Johnston

Technical Reports Recently Received in the Computer Library

Cornell University, Dept. of Computer Science.

- | | |
|---------------------------------|---|
| Bracha, Gabriel. | Randomized agreement protocols and distributed deadlock detection algorithms. |
| Constable, R.L. & Mendler, N.P. | Recursive definitions in type theory. |
| Constable, R.L. et al. | Writing programs that construct proofs. |

Newcastle upon Tyne, University.

- | | |
|----------------------------|--|
| Anderson, T. | Can design faults be tolerated. |
| Anyanwu, J. & Marshall, L. | A crash resistant UNIX file system. |
| Panzieri, F. | Design and development of communication protocols for local area networks. |

Marina del Rey, Univ. of Southern California.

- | | |
|-----------------|---------------------------------|
| Mann, W.C. | Research on knowledge delivery. |
| Matthiessen, C. | Choosing tense in English |

Stanford, University.

- | | |
|---------------------------------|--|
| Finger, J. & Genesereth, M. | RESIDUE: deductive approach to design synthesis. |
| Genesereth, M.R. et al. | Solving the prisoner's dilemma. |
| Ginsberg, Matthew L. | Counterfactuals. |
| McKinlay, J. & Genesereth, M.R. | Expressiveness and language choice. |
| Yao, Andrew C. | Uniform hashing is optimal. |

Stephanie Johnston

Consulting and Enquiries

Advising Supervisor	Terry Jones	MP345	4757
External Marketing Consultant	Ihor Prociuk	MP350	6875
Erindale College	Joe Lim	2035	828-5311
Scarborough College	William Barek	S626	284-3173
General Enquiries	Dale Wright	EA206	4990
Account & Access Code Enquiries (U of T)	Agatha Stevens	MP337	8703
Account & Access Code Enquiries (External)	Sylvia May	MP337	7148
Tape Library (Academic Services)	Stella Martin	MP368	7319
Tape Library (Administrative Services)	Miranda Fong	MP368	6693
Terminal Rentals	Theresa Kusy	SF4306	3787
U of T Computer Library	Stephanie Johnston	EA206	2987
Central Advising Office (Appointments)	HELP	300 Baud Interactive Services	6200
Central Advising Office (Phone-in)	HELP	1200 Baud Interactive Services	3959
Microcomputer Support Group(MSG)	8701	DATAPAC	4320, 0056
Numerical/Statistical Advising(SNAC)	STAT	Telenet	0302043200056
System Status Enquiries (IBM)	7393	Tymnet	<backspace> DPAC;302043200056

UTCS Directory

Director	Dr. Warren Jackson	MP350	8948
Associate Director	Eugene Siciunas	MP350	5058
Managers			
Communications & Technical Support	Norman Housley	SF4306	4967
Internal Systems & Administration	Ron Vander Kraats	MP350	4428
Operations	Dr. Bob Chambers	MP350	7092
Systems	Bill Lauriston	MP331	3579
User Interface	Don Gibson	MP350	7331

Committees on Computing

UTCS Board	Chairman	Prof. D.M. Nowlan	4984
Committee on Academic Computing	Chairman	Prof. J.Z. Buchwald	7391
Committee on Computer Networks & Telecommunications	Chairman	Mr. A. Heyworth	4936
Committee on Computing Facilities & Services	Chairman	Prof. J.D. Bossons	8626
Natural Language Processing Steering Committee	Chairman	Prof. I. Lancashire	828-5273
UTCS Users' Committee	Chairman	Prof. J.T. Stevenson	6930
	Secretary	Ms. C. Pereira	4463

UTCS Terminal and Advising Sites

Names and Locations

- Central Advising Office (CAO), 978-HELP
- Education Facility (Educ), McLennan Labs, 60 St. George St., Room 221
- Engineering Annex (EAT, CDF), 11 King's College Road, Rooms 103, 104, 107, 107B, 201, 203.
- Erindale College (Erin), 828-5339, Mississauga Road, Erindale Campus, Rooms 2005, 2039, 2045
- Robarts, Robarts Library, 130 St. George St., Room 1061A
- Scarborough College (Scar), 284-3122, Military Trail, Scarborough Campus, Rooms S624, S625, S627, S628, S628A
- Sidney Smith (AST & ASUT), 100 St. George St., Rooms 1071, 1073, 2104, 2105
- St.Michael's College, 121 St. Joseph St., Room 101
- Trinity College, 6 Hoskins Ave., Room 024
- Victoria University, 73 Queens Park Cres., Room 005.

Sites	Hours of Operation				Restrictions*	Advising
	Mon-Thurs	Fri	Sat	Sun		
AST	8:00-22:00	8:00-22:00	8:00-22:00	8:00-22:00	None	978-HELP for Research
ASUT	Closed for the summer.					
CAO	10:00-18:00	10:00-18:00	closed	closed	Research	978-HELP
CDF	24 hrs	24 hrs	24 hrs	24 hrs	Undergrads	No
EAT	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Educ	24 hrs†	24 hrs†	24 hrs†	24 hrs†	Research**	978-HELP
(outer)	24 hrs†	24 hrs†	24 hrs†	24 hrs†	Research	978-HELP
Erin (2039)□	9:00-17:00	9:00-17:00	12:00-16:00	12:00-16:00	Research	Rm 2005
(2045)	24 hrs	24 hrs	24 hrs	24 hrs	Undergrads	Rm 2005
Robarts	8:30-23:00	8:30-18:00	9:00-17:00	closed	None	978-HELP for Reseach
Scar	9:00-24:00	9:00-24:00	10:00-17:00	closed	Research	Rm S626
					Undergrads	Rm S626-A
St.Michael's°	24 hrs	24 hrs	24 hrs	24 hrs	None	Arranged by College
Trinity	8:00-17:00	8:00-17:00	closed	closed	None	Arranged by College
Victoria°	8:30-23:00	8:30-23:00	closed	closed	None	Arranged by College

* Research includes graduates, faculty, staff. ** May be unavailable due to UTCS courses. □ key access available.
† Building open Mon. - Thurs. 7:00 - 22:00, Fri. 7:00 - 17:00. Building closed Sat. & Sun. ° may be closed for summer by College.

Advising Hours

CAO Monday through Friday, 10:00 - 18:00
Scar Monday through Friday, 09:00 - 17:00
Erin Mon. 09:00-17:00, Tues.-Thurs. 09:00-20:00, Fri. 09:00-17:00.

Services Available
(Y=yes, N=no)

	Keypunch	PACX	Printers	Network Terminal Server	DCS Micros
AST	N	N	Y	Y	N
ASUT	N	N	Y	N	N
CDF	N	N	Y	N	N
EAT	Y	N	Y	Y	N
Educ	N	Y	N	N	N
Erin	N	Y	Y	Y	N
Robarts	N	Y	Y	N	Y
Scar	N	Y	Y	Y	N
St.Michael's	N	Y	Y	N	Y
Trinity	N	N	Y	N	N
Victoria	N	Y	Y	N	N

UTCS Services

The principal mandate of UTCS is to plan, implement, and operate central computer facilities and “common-

carrier” data networks, and to plan and support divisional, departmental or project computer facilities as requested.

UTCS Centrally Owned and Managed:

Systems

IBM MVS

- TSO, WYLBUR, APL, Batch
- 4381-R03 dual processor, 32 megabytes of memory
- MVS operating system

IBM VM/CMS

- provides General Purpose Timesharing, access to NetNorth, BITNET, and EARN networks
- 4381-P02 processor, 16 megabytes of memory
- CP operating system, VM/SP Release 3
- CMS timesharing system, VM/SP Release 3
- RSCS spooling system, Release 3

GP UNIX

- provides General Purpose Timesharing using UNIX
- typesetting hardware (CAT/8), and (Varian) for previewing output
- main UTCS node for USENET, the international UNIX network
- offers USENET “news” and electronic mail to most uucp sites

Services

Communications & Technical Support

Primary Phones: 978-3787, 978-4967

- Communications Group provides communications systems, terminals, modems, data channels: consulting and installation.

- Field Service Group installs and maintains communications and computer systems on a contract basis or on a cost-per-call basis.
- provides consulting on computer systems technology and installs computer systems
- provides access between the IBM systems and machines using UNIX, VMS and other operating systems. Ethernet and Pronet technologies are used over various transmission media including optical fibre. More basic communications techniques are also used for moderate speed links.
- provides access to NetNorth (BITNET), the North American Universities Network, and USENET, the UNIX networking fraternity.
- will provide a communications solution to department needs on a contractual basis.

User Interface Group

Primary Phone: 978-HELP

- provides advising, consulting and documentation on:
 - command languages including CMS, TSO, WYLBUR, JCL and UNIX
 - high level languages including FORTRAN, APL and PL/I
 - packages and libraries including SAS, SPSS-X, BMDP, IMSL and NAg
 - editors and formatters including XEDIT, TSO, WYLBUR, ed, SCRIBE, nroff/troff
- installs and maintains application packages
- provides courses on the more popular services
- provides general micro support:
 - selection consulting for hardware and software
 - Micro Lab for evaluation of hardware and software
 - advice on University discounts
 - media conversion and data transfer
 - operates UTCS Microcomputer Bulletin Board System

Facilities Managed by UTCS

Administrative Computing

- provides administrative IMS/VS,DB/DC, Batch and TSO
- 4341-P02 processor, 16 megabytes of memory
- MVS operating system

UNIX SAS (Statistical Analysis Services)

- provides UNIX Statistical Analysis Service (Dept. of Statistics only)
- PDP-11/70, 4 megabytes of memory
- UNIX Seventh Edition

Computer Disciplines Facility

VAX-11/780 (4 megabytes of memory)
VAX-11/750 (4 megabytes of memory)
VAX-11/750 (3 megabytes of memory)

- provide Computer Science interactive access
- UNIX (Berkeley Unix 4.2BSD)

82 Pronet-linked Microcomputers

- provides introductory Computer Science instruction
- MS/DOS with Turing environment

Scarborough College Systems

VAX-11/750 (5 megabytes of memory)
VAX-11/750 (2 megabytes of memory)

- provides instructional access using UNIX (Berkeley Unix 4.2BSD)

Erindale College Systems

VAX-11/780 (4 megabytes of memory)

- provides instructional access using VMS
- provides research access

VAX-11/750 (5 megabytes of memory)

- provides instructional access using UNIX (Berkeley Unix 4.2BSD)

Private Funding - Alumni Affairs

VAX-11/750 (6 megabytes of memory)

- provides database services to the owner departments using VMS

UTCS COMPUTERNEWS Subscription Request Form

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 ☐ change
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Toronto, Ontario
M5S 1A1

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